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CENTRAL INTELLIGENCE AGENCY
WASHINGTON 25, D. C.

#10

4 MAY 1962

MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : STRATEGIC MISSILE BULLETIN: "Past Experience
in Organizing and Conducting Special Training
Exercises for Officer Personnel of a Technical-
Repair Base in the Period of its Formation"

1. Enclosed is a verbatim translation of an article which appeared in a Soviet Ministry of Defense publication called Information Bulletin of the Missile Troops (Informatsionny Byulleten Raketnykh Voysk). This publication is classified TOP SECRET by the Soviets and was first issued in 1961. It is intended for generals and officers of the Missile Troops.

2. In the interests of protecting our source, this material should be handled on a need-to-know basis within your office. Requests for extra copies of this report or for utilization of any part of this document in any other form should be addressed to the originating office.

Richard Helms

Richard Helms
Deputy Director (Plans)

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Original: The Director of Central Intelligence

cc: The Director of Intelligence and Research,
Department of State

The Director, Defense Intelligence Agency

The Director for Intelligence,
The Joint Staff

The Assistant Chief of Staff for Intelligence,
Department of the Army

The Director of Naval Intelligence
Department of the Navy

The Assistant Chief of Staff, Intelligence
U. S. Air Force

The Director, National Security Agency

Director, Division of Intelligence
Atomic Energy Commission

National Indications Center

Chairman, Guided Missiles and Astronautics
Intelligence Committee

The Deputy Director of Central Intelligence

Deputy Director for Intelligence

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Assistant Director for Scientific Intelligence

Director, National Photographic Interpretation Center

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COUNTRY : USSR

SUBJECT : STRATEGIC MISSILE BULLETIN: "Past Experience in Organizing and Conducting Special Training Exercises for Officer Personnel of a Technical-Repair Base in the Period of its Formation"

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Following is a verbatim translation of an article titled "Past Experience in Organizing and Conducting Special Training Exercises for Officer Personnel of a Technical-Repair Base in the Period of its Formation", which appeared in the 1961 Second Issue of a TOP SECRET Soviet publication titled Information Bulletin of the Missile Troops (Informatsionnyy Byulleten Raketnykh Voysk). The 1961 Second Issue was sent to press on 19 September 1961.

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Past Experience in Organizing and Conducting Special
Training Exercises for Officer Personnel of a Technical-
Repair Base in the Period of its Formation

The comparatively long duration of the formation period (in certain cases not less than a year) makes the task of working out the most efficient methods of organizing and conducting special training for technical-repair base (remontno-tekhnicheskaya baza -- RTB) officer personnel extremely urgent. This problem acquires specially important significance for RTBs destined to work with the missiles (izdeliye) that are undergoing flight tests at the present time, because in this instance neither the troop units nor even the training centers have had at their disposal for any length of time the necessary documentation on the equipment or the technological and ground equipment.

At the same time, practical experience shows that it is just the formation period which is most favorable for the preliminary theoretical training of officers of assembly teams (brigada) before they master at first hand the materiel aspect of the missile and technological equipment. "The Program of Special Training for an RTB, Motor Transport Type" (Book Two) has been very helpful in this respect, particularly for RTBs formed in 1960. Together with the necessary instructions on method, the subject matter of special training was precisely defined in the program under these sections: equipment; combat service; physical fundamentals and combat characteristics of nuclear weapons; and the fundamentals of electrical engineering and radio engineering.

Let us examine the feasibility of conducting exercises with RTB officers in the formation period on the subject of each of the above sections.

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If a unit does not have the documentation from the Ministry of Medium Machine Building on the operation of equipment and if it has not yet received practice warheads and technological equipment, there undoubtedly is no possibility of making a specific study, much less a qualitative study, of the majority of training problems in the "Equipment" section. At the same time, however, this situation in no way means that the exercises on this section should be eliminated.

There are the following possible ways of fulfilling the training plan under the section, "Equipment":

1. The use of drawings and technical descriptions of missiles that are in service, for mastering such subjects as subject 3, "The Electrical System of Internal Preheating"; subject 4, "The Casing of the Nose Cone"; subject 21, "The Container for the Nose Cone"; and subject 23, "The Structure of the Nose Cone with Conventional Filling". In several cases, theoretical exercises on these subjects may be supplemented by exercises on training equipment (with the use of training equipment of other missile units, etc.).

2. It is possible to work out all the training problems, almost in their entirety, of subject 24, "Safety Techniques When Working with Special Nose Cones", on the basis of the regulations, legislation, and instructions in force in the national economy of the USSR. Thus, in Military Unit 33899, a manual on safety techniques was produced by a collective of engineers on the basis of instructions on safety techniques published by several civil ministries. This manual on safety techniques contained instructions on safety techniques when working with explosives, heavy current sources, high pressure vessels and pipelines, a motor crane, battery charging station, radioactive substances, corrosive (agressivnyy) liquids, assembly-rigging equipment, and instructions on fire protection measures.

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3. Conducting introductory exercises in individual subjects and training problems relating to the construction of a warhead (subjects 1 and 2, 5 to 20 of Chapter 11, "The Nose Cone of a Missile"), by officers who have previously served in an RTB or have been trained in training centers. Practical experience shows that officers coming from other arms of the armed forces to form an RTB display an especially great and lively interest in such exercises. These exercises may also take the form of original introductory lectures, with the purpose of preparing officers for a purposeful, directed study of the principles of electrical engineering and radio engineering, a knowledge of which is essential for mastering the electrical devices and diagrams employed in special equipment.

4. Using the data of RTB T/O&E for getting an initial idea of the function and composition of the set of mobile workshops (subject 1 of Chapter IV, "Ground Equipment") and a set of placards for familiarization with the arrangement of the mechanisms of the mating machine (stykovochnaya mashina). The officers of assembly teams have the opportunity of mastering completely the following assemblies and machines at the equipment depot of a missile unit: 8N03 battery charger; 8N01 gasoline generator unit; 8T311 decontamination and neutralization machine; and the 8G27 air preheater. The study of the ground equipment listed above is facilitated by the fact that similar machines and assemblies are part of the sets of ground equipment of many missiles.

5. A broader use of the opportunities afforded by non-secret technical publications, by the aid of which it is possible to become familiar with the performance characteristics of the "Cactus" (kaktus) dosimetric apparatus (subject 11, Chapter III, "Technological Equipment"). A description of this subject is given in the "Guide on Dosimetric Instruments" published by the Atomic Publishing House (Atomizdat) in 1959. There is an analogous situation also regarding the DEK-51 motor crane, which is used in the national economy.

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6. Making models of individual assemblies of ground equipment, of the casing of a nose cone, etc. Thus, a model of the 8F06 electro-thermal cover (elektrotermochekhol) with the removal system, an exact copy of its construction reduced 7.5 times, was made by the improvers' collective of Unit 33899. The model permits the training of personnel of launch groups in carrying out all operations, without exception, connected with putting on and removing the electro-thermo cover. Using a model like this in exercises has, first of all, a definite economic effect because it ensures maintaining the annual norm of expenditure for the putting on and taking off cycles of the authorized electro-thermo cover. According to the same principle, a model of a cargo platform (gruzovaya platforma) with the mechanisms of the 8T322 mating machine and a model of the reverse speed of the 8T145 transporter are being made, and by means of these it will be possible to carry out in its entirety the operation of mating the nose cone to the missile.

A very great effect could be obtained by making models like these centrally in one of the industrial organizations by order of the Ministry of Defense. Undoubtedly, this will require an expansion of the table of allowances for training equipment now in force in missile units.

7. Organizing the study of the planned program of subjects on the carrier-missile (subjects 1 to 3 of Chapter I), under the direction of the technical personnel of a missile unit. When working out subject 2, attention should be paid to the structure and function of the "APR" system of the carrier-missile, a knowledge of which is vitally important for officers of an RTB.

Skill in working on equipment must be inculcated in officers from the very first days of their arrival in an RTB. In this, it is essential to use all the resources available in the unit. Officers' knowledge of the structure of equipment must be constantly improved.

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The command personnel of an RTB, in the person of its commander, deputies, and staff officers, must take the most direct and active part in organizing and conducting special training instruction and must apply the maximum of intelligent initiative. The personal participation of the RTB command personnel in conducting exercises and their excellent knowledge of the principles of structure of equipment will discipline all officer personnel and engender in them an interest in mastering their new specialty.

During the formation of an RTB, the officers must also master several problems of combat service and must do so in equal measure to their study of equipment. Of the whole complex of problems in this important section of special training, and before the unit receives technical ground equipment and training warheads, it is advisable to study the following:

1. The distribution of functional duties among the officers of an assembly team;
2. A technological schedule of work with a missile warhead;
3. Draft sketches of structures at the special technical positions of the primary siting area.

When the process of tying-in the special structures begins on the ground and their construction gets under way, officer personnel must study the primary siting area through field travel.

As a preparation for the comprehensive exercises with all the personnel of the assembly teams, it is essential to conduct tactical combat exercises on the subject of "An RTB Assembly Team on the March" to determine the procedure in forming columns, the allocation of personnel to the special motor vehicles, and the organization of combat support.

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When charging facilities are available in a unit, during the formation period it is also possible to study several problems of subject 7, "The Preparation of Storage Batteries", from subjects planned in the program in the section, "Combat Service". This may be done on acid storage batteries using, for example, the resources of the equipment stocks sections of the military districts on whose territory the RTBs are located. It is desirable to organize the training of the officer personnel on alkaline silver-zinc storage batteries using VSTs-25 type storage batteries from the power supplies of night vision devices.

All subjects in the section, "The Physical Fundamentals and Combat Characteristics of Atomic Weapons", must be learned completely in the formation period. "The Short Handbook on the Combat Characteristics of Atomic Weapons and the Means of Antiatomic Defense", which is available to the troops, may be used as the basic training manual on this section. For the command personnel of an RTB, the chiefs of assembly teams, and all officers of groups assembling a "Tar" (gudron) system, this manual cannot be considered adequate and must be supplemented by other training manuals, among which, first of all, should be mentioned the concise encyclopedia, "Atomic Energy", which is very popular with officer personnel. As a supplement to this section of special training for all officer personnel of groups assembling the "Tar" system, it is possible to introduce training on work with insulating gas masks (izoliruyushchiy protivogaz) and sets of standard dosimetric apparatus.

Exercises on the fundamentals of electrical engineering and radio engineering must comprise the main subject matter of the special training for assembly team officer personnel during the formation period. A large part of the training time planned for special training should be set aside for these exercises in the formation period. The training goal in learning the fundamentals of electrical engineering and radio engineering is to get a clear understanding of the physical processes taking place in the equipment being used, which is the main training goal of all special training for assembly team officer personnel.

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To get a high standard in mastering the fundamentals of electrical engineering and radio engineering, the training group of engineers and technicians envisaged in the program may be divided into two independent training groups:

The first group contains engineers, also senior technicians (technicians), with secondary technical education, who have worked previously with electrical and radio engineering equipment and are well trained in the area of electrical engineering and radio engineering.

The second group contains senior technicians (technicians) without secondary technical education and poorly trained in the area of electrical engineering and radio engineering.

This separation of officers into groups is made after first getting to know the officers during exercises in a general training group and in individual conversations.

To perform the tasks of special training successfully, it is essential to organize a stock of educational materials which, from the start of the exercises, will permit a theoretical exposition of training problems to be accompanied by the necessary demonstrations and practical exercises (with simple laboratory work). For this purpose a classroom-laboratory is equipped in the administrative and supply area for electrical engineering and radio engineering. This enables exercises to be conducted with a training group of up to 30 persons.

The following may be included in the equipment of the classroom-laboratory: oscillographs with cameras to photograph pulse-type processes (impulsnyy protsess) and comparators for processing photograms; pulse voltmeters, with a collection of voltage dividers; ammeters, voltmeters, TT-2 testers, and tube avometers (lampovyy avometr); standard signal generators; alkaline and acid storage batteries; collection of various resistors, capacitors, and semiconductor devices, produced by our own radio industry; a set of electric vacuum devices (electron tubes, cathode-

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ray tubes, and gas-discharge devices (gazorazryadnyy pribor)); stands for alternating and direct current electrical apparatus; and also a number of other devices and apparatus.

The equipment of the classroom-laboratory must be continually improved. It is advisable to use the laboratory work of officers for this when they are carrying out their individual tasks. First of all, models should be made of individual radio equipment assemblies: a blocking oscillator (bloking-generator) and an amplifier using transistors; a voltage doubling circuit; a pentode coincidence circuit; a quartz-crystal oscillator; an electron key with cathode follower (katodnyy povtoritel); a delay line; an FM discriminator; an amplitude limiter; a triode oscillator with transistors, etc.

Among the obligatory laboratory work on the fundamentals of electrical and radio engineering, it is essential to include the following: checking the intactness and resistance value of BKS insulation; taking oscillograms of the charge and discharge of a capacitor; regulation of electromagnetic relays; investigation of various voltage regulation circuits; charging and boost charging of storage batteries; determination of error in electrical measuring instruments; taking the characteristics of semiconductor devices; and observing pulse processes.

Carrying out this laboratory work and also assembling a model of a certain piece of equipment in accordance with an individual task, make it very much easier for officers, particularly those who are learning the fundamentals of electrical and radio engineering for the first time, to master all training problems and help to train them in a shorter time to fulfil their functional duties.

Laboratory work and individual tasks are done during the time specially allotted for this purpose. This arrangement makes it possible to increase to a considerable extent the number of hours allotted by the program for studying the

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fundamentals of electrical and radio engineering. In other respects, the principle of allotting training time must conform completely with the requirements of the program. In senior technicians' groups there must be five hours daily of planned instruction and two hours of obligatory individual study.

From past experience of exercises in the fundamentals of electrical and radio engineering, the problems in subject 19, "Pulse-Machines", are the most difficult for the majority of officers to master. Even officers with higher technical education come up against certain difficulties in studying this subject.

At the present time a large number of different training manuals are being published on pulse work, both by our own and by foreign authors, which must be used when studying this subject.

Exercises in special training of the basic command personnel of an RTB (commanding officers of assembly teams, their deputies, and commanding officers and engineers of groups) must be conducted at the rate of three days a month. The subjects of the exercises are determined by the commanding officer of the RTB and embrace the study of theoretical questions, mainly new ones as a rule, connected with the development of missile armament. The following may be cited as some examples from the special training subjects of an RTB commanding officer's group: "A Survey of Our Country's Designs for the Body of Special Warheads"; "Thermal Operating Conditions of a Special Warhead in Flight and its Significance"; "Characteristics of Dynamic Stresses Acting on the Warhead in Flight"; "Development in Electrical Circuit Designs of Triode Oscillators Used in Missile Equipment as Voltage Converters"; "Our Country's Systems of Automatic Control of Radioactive Contamination of the Air in Storage Places"; "General Principles of a Controlled Thermonuclear Synthesis"; etc.

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For some important subjects of special training, commanding officers of assembly teams, their deputies, and commanding officers and engineers of groups participate in the exercises of the senior technicians' training groups as trainees or as leaders of the exercises.

Well organized military-technical propaganda in a unit is an important condition for successfully performing the tasks of special training in the formation period. The most important means of doing this is the extensive use by officer personnel of a variety of technical literature. With this aim an extra technical library may be built up in the unit itself, and this library must give periodical publications a considerable place. RTB officers may find much that is useful and interesting to them in copies of "Express-Information" on atomic energy, radio engineering, electronics, and inspection measurement equipment (kontrolno-izmeritelnaya tekhnika); and in the journals "Atomic Technology Abroad", "Problems of Missile Technology", and "Foreign Radio Electronics".

It is advisable that RTB officers should also become familiar with several other technical branches of science, a knowledge of some principles of which is vitally essential in their work. Practical experience shows that among the latter are, in the first place, mechanical drawing and the current government standard (GOST) for drawings, machine parts, and the study of electrical materials (elektromaterialovedeniye).

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